

Informational Leaflet 89

SOME COMMON PARASITES OF THE FISHES OF ALASKA

By:

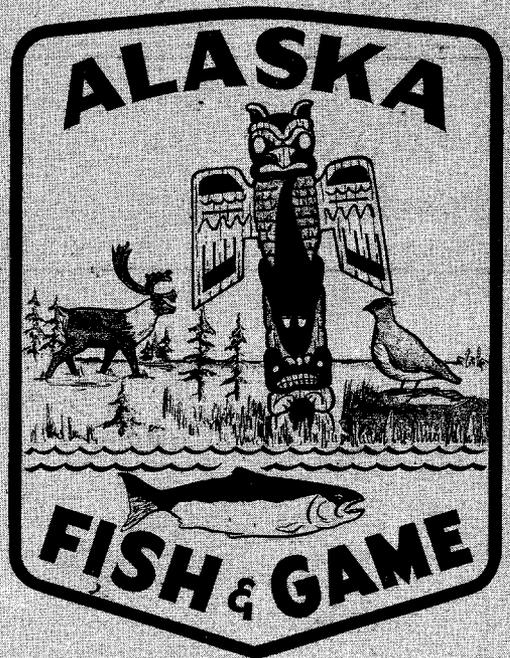
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SOME COMMON PARASITES OF THE FISHES OF ALASKA

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Fishes, like other animals, are subject to attack by a variety of external and internal parasites. When these are seen in fish which have been caught, questions are frequently asked concerning the fishes' edibility and the possible effect on the consumer's health. Very few of the parasites of fish can infect man, and none of them will if the fish are properly cooked or processed.

External Parasites

The external parasites of fishes are easily seen and consist of four groups of organisms: flukes, leeches (blood suckers), copepods (fish lice), and lampreys. Some cling to the exposed body surfaces or live in the gill chambers, feeding on the body mucus or on blood.

Flukes (Trematodes)

There are two major categories of flukes widespread among fish; the Monogenea and the Digenea. The monogenetic flukes are essentially external parasites and have life cycles involving no intermediate host. The digenetic flukes are internal parasites which have life cycles involving from one to three intermediate hosts, each harboring a different larval stage of the fluke. The endoparasitic, digenetic flukes will be discussed later under the heading of internal parasites.

Monogenetic flukes may be found on both saltwater and freshwater fish. Marine fish such as the halibut, sharks and rockfish may be parasitized by a large, leaf or disc-shaped fluke. This fluke characteristically possesses a conspicuous attachment organ of hooks and/or suckers (Figure 1).

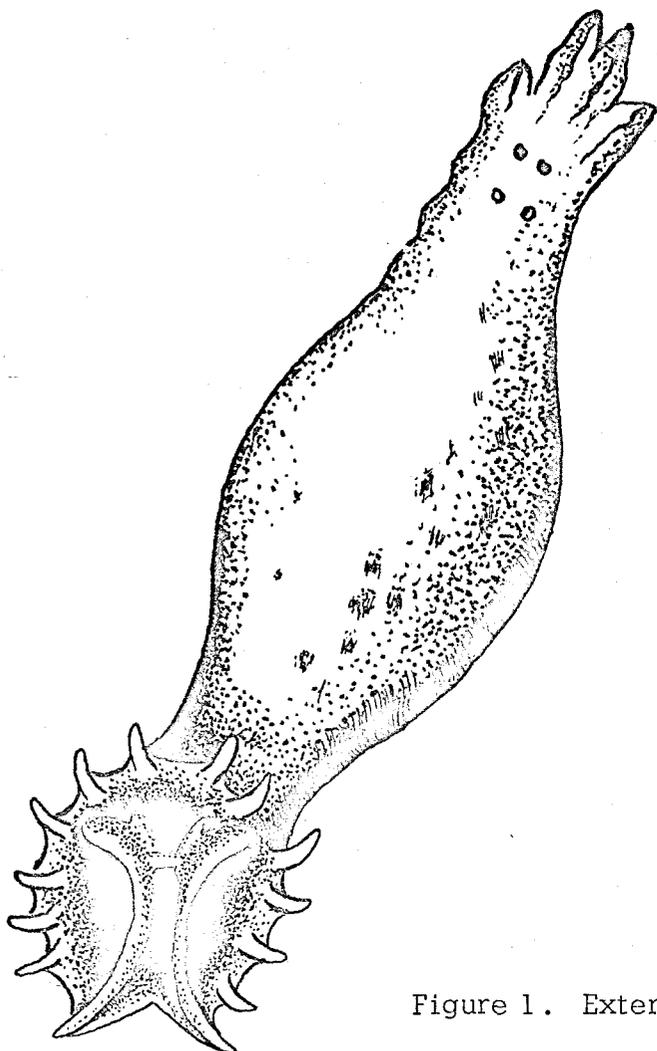


Figure 1. External Fluke, *Dactylogyrus*

Flukes are also common on the gill bars and filaments of marine fish, but are usually quite small and not easily observed, unless the fish is heavily parasitized. Most of the freshwater, monogenetic flukes are microscopic, but one of the larger ones, *Discocotyle salmonis*, often occurs on the gills of salmon and trout. It is about one-fourth inch long and attaches by its rear, sucker-like holdfast organ. Sometimes these flukes become so numerous that the fish's health is affected. Another common monogenetic trematode, *Gyrodactylus*, is usually found in greater numbers on the body than on the gills.

These flukes do not harm the quality of the fish and are easily removed when the fish is cleaned.

Leeches (Annelids)

Leeches are found in most waters of Alaska. They are recognizable by a segmented appearance and a large, ventral sucker at their posterior end (Figure 2). Leeches have direct life cycles, where the newly hatched young look essentially like the adult. Contrary to popular belief, all leeches are not blood suckers. Some are scavengers, while others are predatory on other small aquatic animals. Those which take blood meals are transitory parasites, i.e., they attach to the host for an interval of feeding, after which they leave the host. Leeches do not directly affect the health of a fish unless the fish is subjected to many leeches at one time. If this occurs the host fish may die.

Leeches feed in the gills and other areas of the fish which are normally discarded upon cleaning, so do not affect the edibility of the fish.

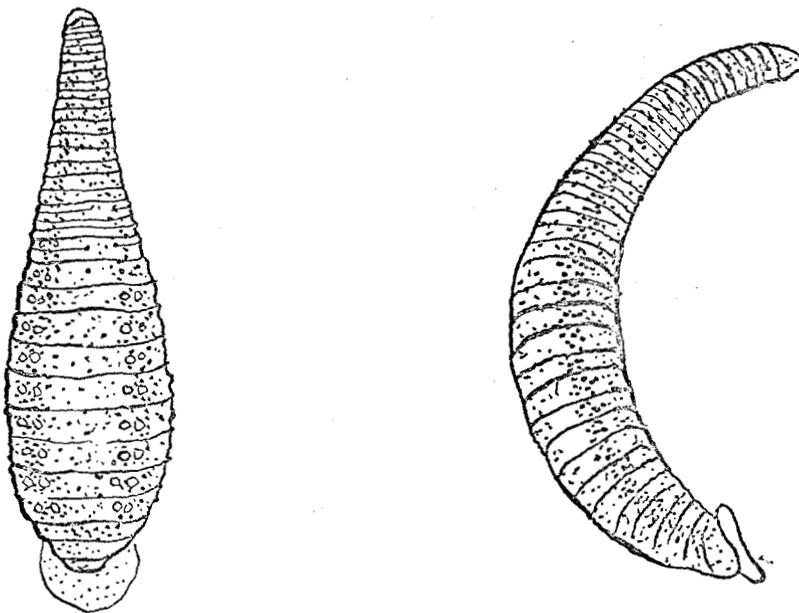


Figure 2. Common Leeches

Fish Lice (Parasitic Crustaceans)

The so-called fish lice are not really lice, but are microcrustaceans. They are allied with the familiar shrimp and crab, but have become highly modified for the parasitic life. The "anchor worm," Lernaea, is usually found at the base of a fin, with its head buried in the fish. The visible part protruding from the fish is cylindrical, whitish, and usually about one-fourth to one-half inch long. They are often two egg sacs extending from the end of the animal. This parasite goes through several development stages, usually on the gills of fish other than the one on which it finally matures.

Fish lice of the genus Argulus may sometimes be seen crawling over a fish. They are among the largest of the external parasites and can easily be seen. They are round or oval when viewed from above, but are dorsoventrally compressed (Figure 3). Four pairs of swimming legs extend from their sides. The eggs are born in sacs attached to the female. The eggs drop off, hatch and the larvae must then find a fish, or perish. This is the common parasite found on salmon and trout when they first enter freshwater. They are not harmful to man or domestic animals.

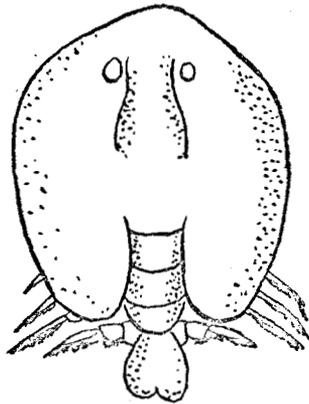


Figure 3. Parasitic Copepod
Argulus, sp.

Lampreys (Agnathans)

The adult pacific lamprey, Entosphenus tridentatus, migrates from the sea into fresh water during the spring months. Spawning takes place in stream riffles, over gravel beds. The adults die soon after spawning. The eggs hatch in a few weeks and the larvae (ammocoetes) burrow into the silt along the margins of the streams. There they feed on organic material and microscopic organisms. Toward the end of their freshwater period the body metamorphoses (changes) to the parasitic adult form (Figure 4). Migration to the sea takes place and the young lampreys begin their predaceous life. The pacific lamprey attacks various fish, including salmon and steelhead trout, attaching itself to the underside of the body. It then rasps a hole through the scale and skin layers of the fish and feeds on the body fluids. Many salmon and trout are taken which have circular scars on the fins and body. These marks or wounds are usually not deep enough to affect the quality of the fish, but can be cut away if desired.

The brook lamprey, Lampetra planeri, is common to many of the streams in Central and Western Alaska. This lamprey is non-predaceous; in fact, in the adult stage it does not feed at all, living only long enough to reproduce the species. The brook lamprey can be distinguished from the pacific lamprey by its smaller size - usually less than ten inches - and they lack strong rasping teeth (Figure 5).

Internal Parasites

The internal parasites of fish may in general be classified as flukes (Trematodes), tapeworms (Cestodes), spiny-headed worms (Acanthocephalans), and round worms (Nematodes). These parasites are found in the body cavity, intestines, various internal organs and sometimes in the flesh. They seldom seriously affect the health of the fish unless present in large numbers.

Internal Flukes

These small worms are flat, leaflike and range up to one-eighth inch in length. The trematodes most frequently seen are larvae (grubs) encysted in the skin or flesh. The largest of these is the yellow grub, Clinostomum marginatum. The cyst is yellowish and often seen in the gills and at the



Figure 4. Pacific lamprey, Entosphenus tridentatus



Figure 5. Brook lamprey, Lampetra planeri

bases of the fins, but may be anywhere on the body. The life history of the parasite is typical for the group. When the fish is eaten by a bird the larva is digested free from the cyst and continues developing in the digestive tract of the bird. The larvae reaches maturity and produces eggs, which are excreted with the bird's wastes into the water. The egg hatches into a microscopic, ciliated, larvae which seeks a suitable snail host. There it develops into a cercaria (free swimming larvae) and leaves the snail. To survive it has about a day in which to contact a fish and burrow into the tissue. Once in the fish, the worm may migrate a short distance before reaching its final resting place where it secretes a cyst wall around itself, thereby completing the cycle.

Another type of fluke is the "black grub" which parasitizes some Dolly Varden char of this area (Figure 6). They are very small larvae enclosed in a black cyst on the skin and the lining of the abdomen. These may be the larvae of any one of many trematodes. The life cycles are all similar to that of the yellow grub. Flounders and halibut are often invaded by larval flukes which do not result in black pigment accumulation. These encysted larval worms appear as tiny opaque patches in the fins and on the light undersurface of the fish.

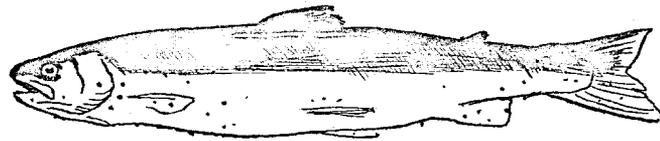


Figure 6. Young Dolly Varden infested with "Black Spot"

Tapeworms (Cestodes)

Two forms of the tapeworm are harbored by fish. The adult lives in the intestine. It is tape-like, segmented, and often several inches in length (Figure 7). It is this stage that is seen when the intestine is accidentally cut or torn during cleaning of the fish. The adult tape worms of the fish are not

infective to man.

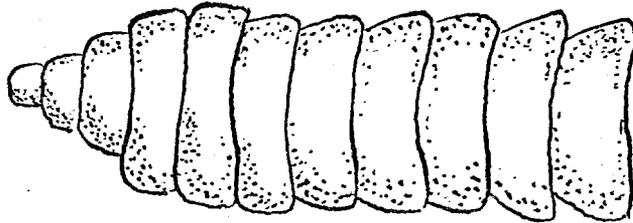


Figure 7. Section of adult tapeworm, D. latum

The white larvae of the fish tape worms, Diphyllobothrium, (Figure 8) may be found among the viscera as well as in the flesh, and may be up to an inch in length. Normally the parasites will attain maturity in the intestine of mammals or in certain birds if they eat an infected fish. Some species grow to thirty feet in length and produce millions of eggs, which are excreted in the feces of the host animal. If the eggs fall or are washed into water, a small, swimming larvae hatches out. This very active creature develops into another larval stage when eaten by a certain species of water flea (Copepod). Small fish feed on the infected Copepods and if a larger fish such as the salmon or trout eats the small fish, the larva will continue to develop. Man can become infected by eating improperly prepared fish containing the larval stage of D. latum.

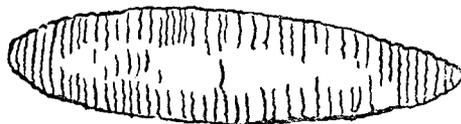


Figure 8. Larval Tapeworm

Spiny Headed Worms (Acanthocephalans)

These worms derive their name from the structure of their proboscis (a projection of the head). This organ is armed with many hooks, which penetrate the intestinal wall of the host and hold the worm in place (Figure 9). Acanthocephalans do not feed actively. Like many other internal parasites, they take nutrients by absorption through their skin.

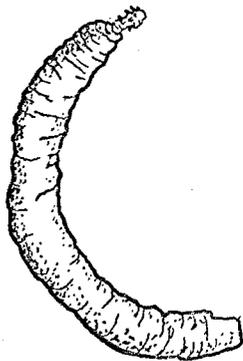


Figure 9. Spiny-headed worm,
Neoechinorhynchus rutili

The aquatic members of this class utilize crustacea as their intermediate host. The crustaceans eat the worm's eggs, which have been excreted by a fish. The eggs develop into infective larvae and when the crustaceans are eaten by fish the larvae mature in the fish's digestive system. If present, they are removed with the viscera when the fish is cleaned. These worms do not infect man.

Roundworms (Nematodes)

Larval roundworms (Nematodes) in the flesh and viscera of marine and freshwater fish best fulfill the popular conception of "worms." They

maybe found in the digestive tract, blood vessels or tissues of the body. The life cycles of roundworms generally are not so complex as those of the flat worms. The majority of this group are free-living in the soil or water. The members which have adopted parasitic habits in plants and animals are very similar to their non-parasitic relatives. Among a few species there is an alternation between free-living and parasitic generations and, with some, the larvae are free-living before entering the host. One of the largest roundworms seen in the body tissues is Eustrongylides. It is a red worm coiled in a cyst one-fourth inch in diameter. This worm is also found among the viscera and is sometimes observed while cleaning the fish. The life cycle of this roundworm is not entirely known, but it is probably that a bird is the final host.

A very long, thin, roundworm, Philometra, is found in salmon and trout. When occurring in large numbers it can damage the fishes' reproductive organs. Roundworms are usually discarded with the entrails and never noticed. Occasionally they may be seen and the result is an unnecessary waste of fish. Usually a fish eating bird or mammal serves as the final host of roundworms. However, certain species found in marine fishes are able to infect man, sometimes causing perforation of the stomach or intestine.

Recommendations for Using Fish as Food

1. Always clean fish as soon after catching as convenient. This avoids the possibility of migration of intestinal worms into the flesh after the fish dies. Fish keep better when promptly cleaned.
2. It is good practice either to cook thoroughly, freeze at -10°F . for forty-eight hours, or "candle" the filets and remove infested portions of fish when parasites are found in the fish.
3. It is possible that domestic animals that are fed raw fish may have been exposed to larval parasites. Such animals should be periodically examined and treated, if necessary, using the anti-worm medicines readily available from drug stores and veterinarians.

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